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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/831,139	06/21/2001	Friedrich Mueller	1998P04724	9013
24131	7590	01/22/2008	EXAMINER	
LERNER GREENBERG STEMER LLP			HARPER, V PAUL	
P O BOX 2480			ART UNIT	PAPER NUMBER
HOLLYWOOD, FL 33022-2480			2626	
			MAIL DATE	DELIVERY MODE
			01/22/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 09/831,139  
Filing Date: June 21, 2001  
Appellant(s): MUELLER, FRIEDRICH

**MAILED**

**JAN 22 2008**

**Technology Center 2600**

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**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 11/19/2007 appealing from the Office  
action mailed 01/22/2007.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

This appeal involves claims 11-14.

**(4) Status of Amendments After Final**

No amendment after final has been filed.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

5,864,603	HAAVISTO	1-1999
5,22,121	SHIMADA	6-1993

Markowitz, J. A. "Using Speech Recognition" Prentice Hall PTR, 1996, pp. 35-38.

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haavisto et al. (U.S. Patent 5,864,603), hereinafter referred to as Haavisto.

Regarding **claim 11**, Haavisto discloses an apparatus for controlling a telephone with voice commands. Haavisto's apparatus includes the following:

- a speech recognition device configured to recognize acoustic objects, where the acoustic objects comprise at least one of individual letters, combinations of letters or control commands (col. 4, lines 23-27; Figs. 1-3 indicates various states during the

speech recognition; col. 6, describes various commands that are recognized: "Cancel," "Yes," "No"); and

- an acoustic device for acoustic output or optical display of recognized acoustic objects (col. 6, lines 23-45, responds "Was the number"), wherein
- if an acoustic object is incorrectly recognized, the speech recognition device subsequently recognizes a first control command causes a speech recognition algorithm to expect repeated utterance of the incorrectly recognized object (col. 6, line 33-57, answers "No" where the phone will go into state voice control; if the recognition failed .... The phone responds "Number again, please"), and
- a second control command causes the speech recognition algorithm to output at least one further acoustic object (col. 6, line 33-57, the phone responds "Number again, please").

Haavisto also describes the recognition of an acoustic object with multiple possible matches associated with probabilities (col. 4, lines 10-23, multiple phone numbers), but Haavisto does not specifically disclose (as part of a particular embodiment) "a recognition probability of the at least one further acoustic object is less than the recognition probability of the previously output acoustic object, but greater than the recognition probability of other acoustic objects." However the examiner contends that these concepts were well-known in the art as taught in the prior art section of Haavisto.

Haavisto in the prior art section describes prior teachings where during the recognition process several potential recognition objects are identified including a best

result, a next best result, etc. where the candidates are arranged in order (col. 2, lines 28-39; "if the user gives a negative answer ..., the phone selects the result that is the second best match to the recognition" and "as a response to a voice command ... the telephone indicates ... the next best candidate, when the candidates have been **arranged in order**").

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Haavisto by specifically providing the feature, as taught by Haavisto's prior art, because it was well known in the art at the time of invention as an improvement when selecting from several possible recognition results (Haavisto, col. 2, line 27-32).

Regarding **claim 12**, Haavisto in view of Haavisto's prior art teaches everything claimed, as applied above (see claim 11). In addition, Haavisto teaches "recognition of a third control command causes the speech recognition algorithm to assess the last-output object as correctly recognized, ends any output of further objects and/or triggers a function corresponding to the recognized control command" (col. 6, lines 34-40; the user may respond "Yes" ..., there follows a transition to a state Dialing).

Regarding **claim 13**, Haavisto discloses method for controlling a telephone with voice commands. Haavisto's method includes the following steps:

- providing a recognition algorithm to recognize acoustic objects, where the acoustic objects comprise at least one of individual letters, combinations of letters or control

commands (col. 4, lines 23-27; Figs. 1-3 indicates states during the speech recognition;

col. 6, describes various commands that are recognized: "Cancel," "Yes," "No")and

- acoustically outputting or displaying recognized acoustic objects (col. 6, lines 23-45, responds "Was the number"),

- wherein if an acoustic object is incorrectly recognized, the recognition algorithm subsequently recognizes a first control command causes a speech recognition algorithm to expect repeated utterance of the incorrectly recognized object (col. 6, line 33-57, answers "No" where the phone will go into state Voice control; if the recognition failed .... The phone responds "Number again, please"), and

- a second control command causes the speech recognition algorithm to output at least (col. 6, line 33-57, the phone responds "Number again").

Haavisto also describes the recognition of an acoustic object with multiple possible matches as associated with a probabilities (col. 4, lines 10-23, multiple phone numbers ), but Haavisto does not specifically disclose (as part of a particular embodiment) "one further acoustic object, wherein a recognition probability of the at least one further acoustic object is less than the recognition probability of the previously output acoustic object, but greater than the recognition probability of other acoustic objects, or the further acoustic object is provided by a sequence of entries in a storage device of the device." However the examiner contends that these concepts were well-known in the art as taught in the prior art section of Haavisto.

Haavisto in the prior art section describes prior teachings where during the recognition process several potential recognition objects are identified including a best

result, a next best result, etc. where the candidates are arranged in order (col. 2, lines 28-39; "if the user gives a negative answer ..., the phone selects the result that is the second best match to the recognition" and "as a response to a voice command ... the telephone indicates ... the next best candidate, when the candidates have been **arranged in order**"; furthermore the recognition candidates will necessarily be stored in memory during the recognition process).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Haavisto by specifically providing the feature, as taught by Haavisto's prior art, because it was well known in the art at the time of invention as an improvement in recognition accuracy when selecting from several possible recognition results (Haavisto, col. 2, line 27-32) and an increase in user satisfaction from the improved performance.

Regarding **claim 14**, Haavisto in view of Haavisto's prior art teaches everything claimed, as applied above (see claim 13). In addition, Haavisto teaches "the recognition of a third control command causes the speech recognition algorithm to assess the last-output object as correctly recognized, ends any output of further objects and/or triggers a function corresponding to the recognized control command" (col. 6, lines 34-40; the user may respond "Yes" ..., there follows a transition to a state Dialing).



**(10) Response to Argument**

2. Appellant asserts on p 6:

**A. HAAVISTO falls to teach or suggest, among other limitations of Appellant's claims, a first control command causes a speech recognition algorithm to expect repeated utterance of the incorrectly recognized object, and a second control command causes the speech recognition algorithm to output at least one further acoustic object, as required by Appellant's independent claims 11 and 13.**

More particularly, Appellant's independent claim 11 recites, among other limitations, a data processing system for recognizing speech that includes a speech recognition device configured to recognize acoustic objects. Appellant's claim 11 additionally requires, among other limitations, that the acoustic objects include at least one of individual letters, combinations of letters or control commands. Further, the invention of claim 11 additionally requires, among other limitations, an acoustic device for acoustic output or optical display of recognized acoustic objects. If an acoustic object is incorrectly recognized, the speech recognition device of *Appellant's claim 11 subsequently recognizes a first control command that causes a speech recognition algorithm to expect repeated utterance of the incorrectly recognized object and a second control command that causes the speech recognition algorithm to output at least one further acoustic object. A recognition probability of the at least one further acoustic object of claim 11 is less than the recognition probability of the previously output acoustic object, but greater than the recognition probability of other acoustic objects.* (Italics added)

HAAVISTO teaches the recognition of multiple commands (e.g. "NO", "YES", "CANCEL" see col. 6, and Table 2, note the presence of a "NEXT" command in the table). After the recognition of the user's input the phone responds "Was the number" and then lists the recognition result (col. 6, lines 27-33). If user responds "YES" the number is dialed, and if the user responds "NO" the user is requested to repeat the

number (i.e., "causes a speech recognition algorithm to expect repeated utterance ..."; col. 6, lines 35-57).

Although HAAVISTO teaches multiple voice commands (see Table 2) that respond with acoustic outputs (the recognition results and other prompts), HAAVISTO does not specifically disclose as a feature of his invention the use "a recognition probability of the at least one further acoustic object is less than the recognition probability of the previously output acoustic object, but greater than the recognition probability of other acoustic objects." But the background section of HAAVISTO (hereinafter referred to as HAAVISTO-background) does describe (col. 2, lines 25-40) the teaching of patent number 5,222,121 (SHIMADA) where if the user gives a negative answer (a control command; SHIMADA uses the command "NEXT ONE" col. 5, lines 1-5) in response to the recognition result the next best result is reproduced, when the candidates have been arranged in order. The examiner maintains that the ordering of the best candidate, the next best candidate, and the subsequent candidates is necessarily based on the degree of match between the user's input and the patterns used by the recognizer, where the degree of match for any given potential match is usually indicated by score (or likelihood that there is a match) and the scores (numbers have an inherent ordering). The higher the score the better the match with the highest score the being the most likely match.

3. Appellant asserts on page 7:

More particularly, Appellant's claims require, among other things, that if a first control command to cause a speech recognition algorithm to expect repeated utterance of the incorrectly recognized object **and** a second control command to **cause** the speech recognition **algorithm to output at least one further acoustic object**. Appellant's claims additionally define, among other limitations, **a recognition probability of the at least one further acoustic object** as being less than the recognition probability of the previously output acoustic object, but greater than the recognition probability of other acoustic objects. More simply, Appellant's presently claimed second control command must **cause** the algorithm to output **an acoustic object having a recognition probability that is less than the previously output acoustic object, but greater than other acoustic objects**. ....

See the arguments under §2, above. As argued above HAAVISTO teaches the use of multiple commands and HAAVISTO-background (and SHIMADA) teaches the use of a command ("negative answer" in HAAVISTO col. 2, lines 31-34 or "NEXT ONE" in SHIMADA col. 5, lines 1-5) to present the next best recognition result.

4. Appellant asserts on page 8:

As such, Appellant's specification supports that, in response to one control command, the algorithm expects the word to be repeated, **but in response to a second control command** (i.e., "incorrect", in the preferred embodiment), **the algorithm offers another object to be recognized, without it being necessary for the user to say the object again**. This is additionally supported by the language of claims 11 and 13, which state that **a second control command causes the speech recognition algorithm to output at least one further acoustic object**. As noted above, because the claimed **"at least one further acoustic object"** is **ranked by probability** (i.e., less than the previously offered object, but greater than other objects), the acoustic object that is output **in direct response to** (i.e., "causes") to the second control command, **must be another attempted offering of the desired acoustic output**, and not merely any phrase. Rather, random phrases would not be output by the

algorithm **based on probability**, as required by Appellant's claimed "at least one further acoustic object".

See the arguments under §2. HAAVISTO-background teaches that if the user gives a negative answer the phone selects the result that is the second best match to the recognition (col. 2, lines 28-39). In the same section, HAAVISTO-background also teaches that the candidates have been arranged in order (necessarily based on recognition match as argued previously) and thus the candidates output would not be "random phrases" as suggested by the Appellant's last sentence in the above quoted paragraph.

5. Appellant asserts on page 9:

The recitation of "Number again, please" **cannot** be the result outputted in response to Appellant's claimed "second control command". More particularly, in **HAAVISTO**, the phrase "Number again, please" does not have a **recognition probability of the at least one further acoustic object is less than the recognition probability of the previously output acoustic object, but greater than the recognition probability of other acoustic objects**, as required of the "at least one further acoustic object" of Appellant's claims 11 and 13. As such, the phrase "Number again, please" output by the algorithm in **HAAVISTO** cannot be analogized to Appellant's claimed "at least a further acoustic object" that Appellant's claimed "second control command" **causes** to be outputted.

See arguments above in §2. As argued previously, HAAVISTO teaches the use of multiple commands (col. 6 and Table 2), and HAAVISTO-background teaches the use of the next best candidate in response to a negative command (col. 2, lines 30-39).

Appellant further argues on page 10 that "HAAVISTO would not motivate a person of ordinary skill in this art to add a system, such as the prior art system disclosed in the cited lines of col. 2, of HAAVISTO, to the system disclosed in the cited lines of col. 6. of HAAVISTO." In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the suggested combination results in "an improvement (of the human interface) when selecting from several possible recognition results (HAAVISTO, col. 2, lines 27-32).

Furthermore, "[T]he test [for obviousness] is what the combined teachings of the references would have suggested to those of ordinary skill in the art." *In re Keller*, 642 F.2d 413, 425 (CCPA 1981). "The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1739 (2007); *id.* at 1739-40 ("if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar device in the same way, using the technique is obvious unless its actual application is beyond his or her skill"). In this case, it would have been obvious to add the "next best" feature to HAAVISTO as a way to select the correct recognition result if the first result present was incorrect.

6. Appellant asserts on page 11:

**B. HAAVISTO fails to teach or suggest, among other limitations of Appellant's claims determining a recognition probability of the at least one further acoustic object is less than the recognition probability of the previously output acoustic object, but greater than the recognition probability of other acoustic objects, as required by Appellant's independent claims 11 and 13.**

7. See the arguments in §2, above. HAAVISTO-background (and SHIMADA) teaches an ordering of the recognition results, where the next best candidate can be selected. The examiner maintains that there is an inherent ordering in the speech recognition process where the potential matches can be ranked as to the degree of match (see Markowitz, p. 36, Fig. 2.7, the spoken input is compared to templates and a similarity assessment is performed resulting in a distance metric). The degree of match is represented by a number which might be called a score, probability, distance metric, etc. Since the scores are numbers there is an inherent ordering (e.g.,  $0.9 > 0.75 > 0.60$ ) and given that the best match is the highest score it follows that the next best match would be the next lowest score. If the user, on hearing the results of the first best match, determines that it is incorrect the next (very obvious) choice would be the next best match (i.e. the match with the next lowest score).

8. Appellant asserts on page 12

Previous Office Actions have relied on U.S. Patent. No. 5,222,121 to Shimada ("**SHIMADA**"), in order to find the limitation of Appellant's independent claims that is missing from **HAAVISTO**. However, as it presently stands, the Examiner now contends that this feature is "well known in the art" and disclosed in col. 2 of **HAAVISTO**, lines 28-39, which,

Appellant notes, is merely a reference to the **SHIMADA** patent. Thus, the Examiner apparently withdrew the prior art rejection of record, which combined **HAAVISTO** with **SHIMADA**, in order to assert, solely, the **HAAMISTO** reference, while asserting the teachings of **SHIMADA**, as set forth in the background section of **HAAVISTO**. Appellant respectfully disagrees.

This was done as an attempt to clarify the rejections based on the teachings of **SHIMADA**, by referring to summary of **SHIMADA** given in **HAAVISTO**-background (see Office Action dated 1/22/2007, p. 7).

9. Appellant asserts on page 14:

However, while it is indeed true that **degrees of recognition** may be determined between an input utterance and potential matches, as used in the conventional art, there is simply no disclosure in either **SHIMADA** or **HAAVISTO** as to how the candidates are ranked in order to determine the degree of recognition. Rather, as discussed above, **SHIMADA** simply states that a user can call up the next lower candidate by entering a voice command "NEXT ONE." That is, when the name of the first-place candidate recognized is different from the desired name, the user can call up a number associated with the name of the **lower place candidate** by entering a command. See, for example, col. 5 of **SHIMADA**, lines 15 - 20. Again, **SHIMADA** and **HAAVISTO** fail to provide any teaching, suggestion or motivation, or any discussion, at all, of ordering, degrees of recognition, probabilities or other similar features.

The Appellant admits that "it is indeed true that degrees of recognition may be determined between an input utterance and potential matches" but then goes on to state that "there is simply no disclosure in either **SHIMADA** or **HAAVISTO** as to how the candidates are ranked in order to determine the degree of recognition." The appellant has this reversed; the degree of recognition determines the ranking not vice versa. That

is the degrees of recognition between the utterance and the patterns are determined which are represented by numbers (metrics) and these numbers have an inherent order.

10. Appellant asserts beginning on page 14:

However, in the **final Office Action**, the Examiner implies **that the mere fact a recognition occurs** means that there is inherently some form of ordering or degree of recognition. A review of the **MARKOWITZ** reference shows that there are different methods of voice recognition, for example, template matching, acoustic- phonetic and stochastic processing. While a degree of recognition and/or ordering may indeed occur, *because of the methods applied, there is no disclosure of the recognition in MARKOWITZ, and MARKOWITZ also fails to teach or suggest, among other things, the particular ranking of probabilities required by Appellant's claimed invention.* Among other things, **HAAVISTO, SHIMADA and MARKOWITZ** fail to teach, suggest, motivate, or provide any consideration of a recognition probability of the at least one further acoustic object is less than the recognition probability of the previously output acoustic object, but greater than the recognition probability of other acoustic objects, as required by Applicant's claims. (Italics added)

Markowitz was introduced (in the arguments) to give background information on the recognition process and states that the matching process generates an overall similarity assessment (usually called the distance metric) of potential matches (p. 36, bottom of the first paragraph, Fig. 2.7). This distance metric corresponds to the Appellant's probability (see specification p. 2, lines 34-37, "the speech recognition algorithm determines recognition probabilities  $\{p_1, p_2, \dots, p_n\}$  with the property  $1 > p_1 \geq p_2 \geq \dots \geq p_n > 0$ ). Also note that the similarity metric is a number and numbers have inherent ordering.



**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.


For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

V. Paul Harper

**V. PAUL HARPER  
PRIMARY PATENT EXAMINER**

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